

1 CLAIMS

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3 1. A method of determining portions of a surface within a space that are  
4 occluded from an observation point, comprising:

- 5 (a) defining a horizon on the surface with reference to the observation point; and  
6 (b) identifying a region within the space that is beneath the horizon.

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8 2. The method of claim 1, wherein step (b) comprises the step of projecting a  
9 ray from the observation point that intersects the horizon and defines an area that  
10 is occluded from the observation point.

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12 3. The method of claim 1, further comprising the steps of:  
13 (c) determining the depth of the region identified in step (b); and  
14 (d) disregarding the region identified in step (b) when the depth is less than a  
15 predetermined threshold.

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17 4. The method of claim 1, further comprising the step of:  
18 identifying a region within the space that is beyond the horizon.

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20 5. The method of claim 1, wherein step (a) comprises the step of generating a  
21 plurality of coordinates, each of the coordinates including an azimuth angle,  $\alpha$ , and  
22 a horizon elevation angle,  $\theta$ .

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24 6. The method of claim 5, wherein said generating step comprises, for each  
25 coordinate, the steps of:

- 1 (i) selecting  $\alpha$ ;
- 2 (ii) determining  $\theta$ , so that a ray projected from the observation point at angles  $\alpha$
- 3 and  $\theta$  intersects an apex of the surface.

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5 7. A system for determining portions of a surface in a space that are occluded

6 from an observation point, comprising:

7 means for defining a horizon on the surface with reference to the observation

8 point; and

9 means for identifying a region within the space that is beneath the horizon.

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11 8. The system of claim 7, wherein said identifying means comprises means for

12 projecting a ray from the observation point that intersects the horizon and defines

13 an area that is occluded from the observation point.

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15 9. The system of claim 7, further comprising:

16 means for determining the depth of the region that is beneath the horizon; and

17 means for disregarding the region that is beneath the horizon when the depth is

18 less than a predetermined threshold.

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20 10. The system of claim 7, further comprising:

21 means for identifying a region within the space that is beyond the horizon.

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23 11. The system of claim 7, wherein said defining means comprises means for

24 generating a plurality of coordinates, each of the coordinates including an azimuth

25 angle,  $\alpha$ , and a horizon elevation angle,  $\theta$ .

12. The system of claim 11, wherein said generating means comprises, for each coordinate:

(i) means for selecting  $\alpha$ ;

(ii) means for determining  $\theta$ , so that a ray projected from the observation point at angles  $\alpha$  and  $\theta$  intersects an apex of the surface.

13. A computer program product comprising computer program logic for enabling a processor in a computer system to determine portions of a surface in a space that are occluded from an observation point, comprising:

means for enabling the processor to define a horizon on the surface with reference to the observation point; and

means for enabling the processor to identify a region disposed on the surface that is beneath the horizon.